

## ABSTRACT

An improved method for the design and development of high performance hybrid devices having biological and nonbiological components. A figure of merit is developed for the biological component or components. The component is subjected to various environmental 5 variables as it or its biological source organism is grown. The biological component is force adapted to cause its figure of merit to reach a goal or an acceptable measure. The biological component is used in hybrid constructs that may be nanostructures, given the small size of the biological parts. In one specific embodiment, force-adapted chlorosomes of *C. aurantiacus* enhance performance of a silicon photovoltaic cell. The bacteria, *Chloroflexus aurantiacus* (*C. 10 aurantiacus*), strain J-10-f1, has the A.T.C.C. designation number 29366, having been deposited in July, 1976.